

FACT SHEET FOR NPDES PERMIT WA-002958-1

FACILITY NAME

Metropolitan King County East Section Reclamation Plant at Renton

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the State of Washington on the basis of Chapter 90.48 RCW which defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (chapter 173-220 WAC), technical criteria for discharges from municipal wastewater treatment facilities (chapter 173-221 WAC) and water quality criteria for surface and ground waters (chapters 173-201A and 200 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

This fact sheet has been reviewed by the Permittee and errors in fact have been corrected. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments (Appendix D) will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Changes to the permit will be addressed in Appendix D--Response to Comments.

GENERAL INFORMATION	
Applicant	Metropolitan King County
Facility Name and Address	East Section Reclamation Plant at Renton 1200 Monster Rd. S.W. Renton, Washington 98055
Type of Treatment:	Activated Sludge (Secondary Treatment Plant)
Discharge Location	Waterbody Name: Puget Sound Latitude: 47° 36' 04" N Longitude: 122 ° 25' 31" W Waterbody name: Green River Latitude: 47° 28' 07" N Longitude: 122° 17' 37" W
Water Body ID Number	

BACKGROUND INFORMATION

HISTORY

King County owns approximately 75 acres of land at the East Division Reclamation Plant at Renton. The current facilities, located on approximately 35 acres of land, were constructed in 1965 and expanded three times since then. The latest expansion took place in 1997. The East Division Reclamation Plant at Renton presently provides a secondary level of treatment with disinfection of the effluent. The latest expansion added four new coarse screens and upgraded the old ones, added four new sedimentation tanks, modified the secondary activated sludge treatment with the anaerobic selector process, added one new 4-pass aeration tank, added eight new secondary clarifiers, and expanded the disinfection process. The pumping capacity of the effluent pumps will be upgraded to 325 MGD in 1999.

Due to massive expansion of the plant and addition of bio-selectors, it is believed that the effluent quality is altered enough to warrant a new wastewater characterization. The new permit requires the Permittee to conduct acute and chronic biomonitoring and to characterize the effluent from the expanded facility. Also, due to recent expansion and new flow information, a new water quality based analysis and mixing zone study was conducted by the King County. The Department, based on new information, conducted a new reasonable potential study and developed new limits for various parameters.

COLLECTION SYSTEM STATUS

The East Division Reclamation Plant handles an annual average flow of 64 MGD of sewage. The average wet weather flow and dry flow are 115 and 96 MGD respectively. The design peak flow and maximum month flow are 325 and 144 MGD respectively.

There are currently approximately 60 industrial users discharging more than 2.5 MGD of potentially toxic wastewater to the East Division Reclamation Plant. King County has a delegated pretreatment program and is responsible to issue permits and inspect the industries.

The service area includes Algona, Auburn, Bellevue, Black Diamond, Bryn Mawr/Lakeridge SD, Cedar River, Eastgate, Highlands, Issaquah, Kent, King County Landfill, Kirkland, Mercer Island, NE Sammamish, Northshore Utility District, Pacific, Rainier Vista, Redmond, Renton, Sammamish Plateau, Shorewood Apartments, Tukwila, Soos Creek, Skyway, Val View, and WD 107. The 117 miles of separate sanitary collection system serves an estimated population of 615,883. Although the collection system was built to be separate, infiltration and inflow (I/I) have always been a problem as a result of aging system with some of the component agencies. King County is currently preparing a Regional Wastewater Service Plan (RWSP). In this comprehensive plan, the County is proposing a core program to reduce I/I in the highest priority third of the system in all four service strategies. This program is projected to cost \$23 million, most of which will be spent by the year 2010. An enhanced program to reduce I/I by about 30% over the system is proposed for strategies 1 and 4.

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Strategies 1 and 4 will help prevent plant expansions by reducing the I/I in the collection system. It will cost an additional \$106 million over the same period of time out of which the component agencies will contribute about 35% of the costs.

The projected schedules as presented below are partially completed. They are as follows:

Pilot Projects:

Replacing sewer mains, side sewers and manholes in identified “leaky” areas:

- 1993 Kent. Completed with 70% I/I reduction.
- 1993 Issaquah. Completed with 50% I/I reduction.
- 1998 Bryn Mawr-Lakeridge. Phase I projected to be complete.

RWSP Adoption:

- 5/97 Issue draft RWSP to public review and comment
- 3/98 County Executive recommendation to Council
- 12/98 Council adoption of Amended Comprehensive Sewerage Plan.

Core Control Program (all RWSP service strategies):

- 12/98 Obtain funding and FTEs for First Third I/I program
- 12/99 Begin component agency education and participation program
- 9/99- Monitor highest priority third of system for I/I sources
- 6/00
- 12/01 Begin field investigations of highest priority third of system

TREATMENT PROCESSES

Liquid stream treatment consists of coarse screening, pumping, aerated grit removal, primary sedimentation with skimming of floatables, secondary clarification, chlorination, and chlorine contact for disinfection and discharge through a 12-mile long 8-foot diameter transfer line. Primary and waste secondary sludge are co-thickened in dissolved air floatation thickeners. The thickened sludge is fed to anaerobic mesophilic digesters. The digested sludge is combined in a common blending storage tank and then dewatered with belt filter presses. Filtrate is returned to the DAFTs and the liquid recycles from the DAFTs is returned to the secondary aeration tanks. Expanded digester gas scrubbing units and expanded odor control facilities have been provided. Biosolids is hauled offsite for reuse.

DISCHARGE OUTFALL

Secondary treated and disinfected effluent is discharged from the facility through a 12-mile long 8-foot diameter transfer line to two 6-foot diameter outfall lines which discharge by pumping or gravity through diffusers located 10,000 feet off shore at 625 foot depth in Puget Sound.

RESIDUAL SOLIDS

The treatment facilities remove solids during the treatment of the wastewater at the headworks (grit and screenings), and at the primary and secondary clarifiers, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment.

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Grit, rags, scum and screenings are drained and disposed of as solid waste at the local landfill. Solids removed from the screenings are washed, rescreened and accumulated with the dewatered grit for discharge to Cedar Hills Sanitary landfill. Primary and waste secondary sludge are co-thickened in dissolved air floatation thickeners. The thickened sludge is fed to anaerobic mesophilic digesters. The digested sludge is combined in a common blending storage tank and then dewatered with belt filter presses. The treated digested sludge is applied to forest land under a permit from the King County Health Department.

PERMIT STATUS

The previous permit for this facility was issued on March 31, 1993. The previous permit placed effluent limitations on 5-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, Fecal Coliform bacteria, and many other toxic parameters.

An application for permit renewal was submitted to the Department in September 1996 and accepted by the Department in December 1996.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its last inspection in June 26, 1996. A Class II inspection was conducted on January 24-26, 1994. The plant was performing well during the inspection with effective removal of the conventional parameters. The effluent met all permit limits. Bioassay showed toxicity to four of the five species tested. The rainbow trout test did not meet the whole effluent toxicity performance standard. An effluent ammonia concentration of 19.5 mg/L may be responsible for the toxicity found in the effluent. Split sample general chemistry results showed close agreement between Ecology and King County for both sampling and analysis. Of the five priority pollutant metals detected in the effluent samples, only copper exceeded EPA acute marine water quality criteria. It was, however, lower than theoretical water quality based limits based on the calculated dilution factors. All priority pollutant metals found in the sludge sample were in concentrations below EPA sludge limits and the ceiling concentration for land application. A fecal coliform count for the sludge sample exceeded the EPA Class A pathogen limitation.

During the history of the previous permit, the Permittee has remained in compliance, based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department.

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. The effluent is characterized as follows:

Table 1: Wastewater Characterization

Parameter	Concentration
Flow	63.8 mgd, Annual Average
BOD5	240 mg/L, Annual Average
TSS	237 mg/L, Annual Average
pH	6.9 - 7.1 Standard Unit
COD	444 mg/L, Annual Average
Ammonia (as N)	16.5 mg/L, Annual Average
Kjeldahl Nitrogen	32.9 mg/L, Annual Average
Total Phosphorous (as P)	6.11 mg/L, Annual Average

PROPOSED PERMIT LIMITATIONS AND CONDITIONS

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (chapter 173-201A WAC), Ground Water Standards (chapter 173-200 WAC) or Sediment Quality Standards (chapter 173-204 WAC). The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

DESIGN CRITERIA

In accordance with Washington Administrative Code (WAC) 173-220-130(1)(a), effluent limitations shall not be less stringent than those based upon the design criteria for the facility, which are contained in approved engineering plans, reports, or approved revisions. Also, in accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from Regional Wastewater Services Plan prepared by HDR Engineering in August 1994.

Table 2: Design Standards

Parameter	Design Quantity
Monthly average flow (max month)	144 mgd
Monthly average dry weather flow	96 mgd
Monthly average wet weather flow	115 mgd
Instantaneous peak flow	325 mgd
BOD influent loading	220,000 lb./day
TSS influent loading	201,000 lb./day
Design population equivalent	615,883

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TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, fecal coliform, BOD₅, and TSS are taken from chapter 173-221 WAC.

Table 3: Technology-based Limits.

Parameter	Limit
pH:	shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 colonies/100 mL Weekly Geometric Mean = 400 colonies/100 mL
BOD ₅ (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration. Average Weekly Limit = 45 mg/L

The following technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

Monthly effluent mass loadings (lbs/day) were calculated as the maximum monthly design flow (144 MGD) x Concentration limit (30 mg/L) x 8.34 (conversion factor) = mass limit 36,028.8 lb./day.

The weekly average effluent mass loading is calculated as 1.5 x monthly loading = 54,43.2 lbs/day.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The

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Washington State Surface Water Quality Standards (chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state.

Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

ANTIDEGRADATION

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a degradation of existing water quality or beneficial uses.

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CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

MIXING ZONES

The Water Quality Standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention and control (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Puget Sound which is designated as a Class AA receiving water in the vicinity of the outfall.

Characteristic uses include the following:

Water supply (domestic, industrial, agricultural); stock watering; fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall markedly and uniformly exceed the requirements for all or substantially all uses.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliforms	100 colonies/100 mL maximum geometric mean
Dissolved Oxygen	8 mg/L minimum
Temperature	18 degrees Celsius maximum
pH	6.5 to 8.5 standard units
Turbidity	less than 5 NTU above background

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Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)
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CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in chapter 173-201A WAC.

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of UM model component of PLUMES. The dilution factors have been determined to be (from Appendix C):

	Acute	Chronic
Aquatic Life	132	500
Human Health, Carcinogen	N/A	1218
Human Health, Non-carcinogen	N/A	1218

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

BOD--Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitation for BOD was placed in the permit.

Temperature-- Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, no effluent limitation for temperature was placed in the proposed permit.

pH--Because of the high buffering capacity of marine water, compliance with the technology-based limits of 6 to 9 will assure compliance with the Water Quality Standards for Surface Waters.

Fecal coliform--The numbers of fecal coliform were modeled by simple mixing analysis using the technology-based limit of 400 colonies per 100 ml and a dilution factor of 500.

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Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters with the technology-based limit. Therefore, the technology-based effluent limitation for fecal coliform bacteria was placed in the proposed permit.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxins were determined to be present in the discharge: chlorine, ammonia, organic chemicals and heavy metals. A reasonable potential analysis was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.

The determinations of the reasonable potential for various toxic parameters as specified under WAC 173-201A to exceed the water quality criteria or human health criteria were evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. Among various substances mentioned under WAC 173-201A, Toxaphene and Chlorpyrifos were suspicious of having potential to exceed water quality criteria. During public notice period, King County commented on this issue and presented sufficient information on likelihood of absence of these substances in the plant influent. Also, it was realized that method detection and quantification levels for these substances may not be attainable and Permittee may have to develop matrix specific MDL and QL for these substances. Therefore it is not practical to establish, presence of these substances, in the plant effluent at a level to exceed water quality criteria with confidence. This permit requires Permittee to characterize these compounds and submit a report to the Department for review and approval within 36 months from the date of issuance of the permit. The Department, after the review of characterization report may set limits and monitoring frequencies for these substances. However, before characterization, within 12 months from the date of permit issuance, Permittee may determine matrix effect Method Detection Level (MDL) and Quantification Level (QL) for these substances and submit a report to the Department for review and approval. However, if Permittee selects not to conduct matrix effect MDL or QL for these substances, MDLs and QLs as set by Ecology shall be used in the plant influent and effluent characterization.

The parameters used in the critical condition modeling are as follows:

Aquatic Life: Acute dilution factor 132:1, chronic dilution factor 500:1.

Human Health, Carcinogen and Non-carcinogen chronic dilution factor 1218:1.

Water quality criteria for metals in chapter 173-201A WAC are based on the dissolved fraction of the metal.

The Permittee may provide data clearly demonstrating the seasonal partitioning of the dissolved metal in the ambient water in relation to an effluent discharge. Metals criteria may be adjusted on a site-specific basis when data is available clearly demonstrating the seasonal partitioning in the ambient water in relation to an effluent discharge.

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Metals criteria may also be adjusted using the water effects ratio approach established by USEPA, as generally guided by the procedures in USEPA Water Quality Standards Handbook, December 1983, as supplemented or replaced.

Municipal wastewater treatment plants have not been designed for metals removal at the low concentrations needed for compliance with the water quality criteria. WAC 173-201A-100 provides for granting a variance from the numeric mixing zone size criteria for dischargers existing prior to November 24, 1992 provided that:

- a) All known available and reasonable treatment (AKART) is fully applied.
- b) All siting, technological and managerial options which would result in full or significantly closer compliance that are economically achievable are being utilized.
- c) The exceedance would not have a reasonable potential to cause a loss of sensitive or important habitat, interfere with existing or characteristic uses of the water body, result in damage to the ecosystem or adversely affect public health as determined by the Department.

The Department is currently preparing guidance for the Permittee to make the above demonstrations. If a demonstration justifying less stringent effluent limitations for metals is approved by the Department, then effluent limits shall be based on that demonstration.

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

In accordance with WAC 173-205-040, the Permittee's effluent has been determined to have the potential to contain toxic chemicals. The proposed permit contains requirements for whole effluent toxicity testing as authorized by RCW 90.48.520 and 40 CFR 122.44 and in accordance with procedures in chapter 173-205 WAC. The proposed permit requires the Permittee to conduct toxicity testing for one year in order to characterize both the acute and chronic toxicity of the effluent.

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If acute or chronic toxicity is measured during effluent characterization at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity, then the proposed permit will set a limit on the acute or chronic toxicity. The proposed permit will then require the Permittee to conduct WET testing in order to monitor for compliance with either an acute toxicity limit, a chronic toxicity limit, or both an acute and a chronic toxicity limit. The proposed permit also specifies the procedures the Permittee must use to come back into compliance if the limits are exceeded.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC₅₀, EC₅₀, IC₂₅, etc. Ecology recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

When the WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water toxicity, the Permittee will not be given WET limits and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that toxicity has not increased in the effluent.

If the Permittee makes process or material changes which, in the Department's opinion, result in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard". The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

An effluent characterization for acute and chronic toxicity was conducted during the a previous permit term. In accordance with WAC 173-205-060, the Permittee must repeat this effluent characterization for the following reason:

The Permittee has made changes to processes, materials, or treatment that could result in an increase in effluent toxicity. In accordance with WAC 173-205-060(1), the proposed permit requires another effluent characterization for toxicity.

HUMAN HEALTH

The Department has determined that the effluent is likely to have chemicals of concern for human health. The discharger's high priority status is based on knowledge of data or process information indicating regulated chemicals occur in the discharge.

A determination of the discharge's potential to cause a violation of the water quality standards was conducted as required by 40 CFR 122.44(d). The reasonable potential determination was evaluated with procedures given in the Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001) and the Department's Permit Writer's Manual (Ecology Publication 92-109, July 1994). Among various substances mentioned under WAC 173-201A, PCB was suspicious of having potential to exceed human health criteria.

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During public notice period, King County commented on this issue and presented sufficient information on likelihood of absence of this substance in the plant influent. Also, it was realized that method detection and quantification levels for this substance may not be attainable and Permittee may have to develop matrix specific MDL and QL for this substance. Therefore it is not practical to establish, presence of these substances, in the plant effluent at a level to exceed human health criteria with confidence. This permit requires Permittee to characterize the plant influent and effluent for this compound and submit a report to the Department for review and approval within 36 months from the date of issuance of the permit. The Department, after the review of characterization report may set limits and monitoring frequencies for PCB. Also, before characterization, within 12 months from the date of permit issuance, Permittee may determine matrix effect Method Detection Level (MDL) and Quantification Level (QL) for PCB and submit a report to the Department for review and approval. However, if Permittee selects not to conduct matrix effect MDL or QL for PCB; MDL and QL as set by Ecology shall be used in the plant influent and effluent characterization.

SEDIMENT QUALITY

The Department has been unable to determine at this time the potential for this discharge to cause a violation of sediment quality standards. If the Department determines in the future that there is a potential for violation of the Sediment Quality Standards, an order will be issued to require the Permittee to demonstrate that either the point of discharge is not an area of deposition or, if the point of discharge is a depositional area, that there is not an accumulation of toxics in the sediments.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

MONITORING AND REPORTING

Effluent monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

The monitoring and testing schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of

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the Department Permit Writer's Manual for an activated Sludge - Secondary Wastewater Treatment Plant. This frequency of monitoring is considered to be the minimum frequency to document compliance.

Additional monitoring is required in order to further characterize the effluent. These monitored pollutants could have a significant impact on the quality of the surface water.

As a pretreatment POTW, the King County is required to have influent, primary clarifier effluent, final effluent, and sludge sampled for toxic pollutants in order to characterize the industrial input. Sampling is also done to determine if pollutants interfere with the treatment process or pass through the plant to the sludge or the receiving water. The monitoring data will be used by the Department and King County to develop local limits which commercial and industrial users must meet.

EFFLUENT LIMITS BELOW QUANTITATION

The water quality-based effluent limits for some parameters in the wastewater may be below the capability of current analytical technology to quantify. The Quantitation Level is the level at which concentrations can be reliably reported with a specified level of error. For maximum daily effluent limits, if the measured effluent concentration is below the Quantitation Level, the Permittee reports NQ for non-quantifiable. For average monthly effluent limits, all effluent concentrations below the Quantitation Level but above the Method Detection Level are used as reported for calculating the average monthly value.

EFFLUENT LIMITS BELOW DETECTION

The water quality-based effluent limits for some parameters in the wastewater may be below the capability of current analytical technology to detect. The Method Detection Level (MDL) is the minimum concentration of an analyte that can be measured and reported with a 99 percent confidence that it's concentration is greater than zero as determined by a specific laboratory method. For maximum daily limits, if the concentrations are below the MDL the Permittee reports ND for non-detectable. For average monthly limits, all values above the MDL are used as reported and all values below the MDL are calculated as zero.

OTHER PERMIT CONDITIONS

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4. to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4. restricts the amount of flow.

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OPERATION AND MAINTENANCE (O&M)

The proposed permit contains condition S.5. as authorized under RCW 90.48.110, WAC 173-220-150, chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems the Permittee is required in permit condition S7. to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503. The disposal of other solid waste is under the jurisdiction of the King County Health Department.

Requirements for monitoring sewage sludge and recordkeeping are included in this permit. This information may be used by Ecology to develop or update local limits and is also required under 40 CFR 503.

PRETREATMENT

To provide more direct and effective control of pollutants discharged, King County has been delegated permitting, monitoring and enforcement authority for industrial users discharging to their treatment system. The Department oversees the delegated Industrial Pretreatment Program to assure compliance with federal pretreatment regulations (40 CFR Part 403) and categorical standards and state regulations (chapter 90.48 RCW and chapter 173-216 WAC).

To provide more direct and effective control of pollutants discharged to the sanitary sewer, the Permittee is required under 40 CFR Part 403 to develop a pretreatment program to detect and enforce against violations of categorical pretreatment standards promulgated under the federal Clean Water Act.

An industrial user survey may required to determine the extent of compliance of all industrial users of the sanitary sewer and wastewater treatment facility with federal pretreatment regulations (40 CFR Part 403 and Sections 307(b) and 308 of the Clean Water Act), with state regulations (chapter 90.48 RCW and chapter 173-216 WAC), and with local ordinances.

As sufficient data becomes available, the Permittee shall, in consultation with the Department, reevaluate its local limits in order to prevent pass through or interference. Upon determination by the Department that any pollutant present causes pass through or interference, or exceeds established sludge standards, the Permittee shall establish new local limits or revise existing local limits as required by 40 CFR 403.5. In addition, the Department may require revision or establishment of local limits for any pollutant that causes an exceedance of the Water Quality Standards or established effluent limits, or that causes whole effluent toxicity.

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The determination by the Department shall be in the form of an Administrative Order. In order to develop these local limits, the Department will provide environmental criteria or limits for the various pollutants of concern.

The Department may modify this permit to incorporate additional requirements relating to the establishment and enforcement of local limits for pollutants of concern. Any permit modification is subject to formal due process procedures pursuant to state and federal law and regulation.

EFFLUENT MIXING STUDY

The Department has estimated the amount of mixing of the discharge within the authorized mixing zone to determine the potential for violations of the Water Quality Standards for Surface Waters (chapter 173-201A WAC). Condition S.9 of this permit requires the Permittee to more accurately determine the mixing characteristics of the discharge. Mixing will be measured or modeled under conditions specified in the permit to assess whether assumptions made about dilution will protect the receiving water quality outside the allotted dilution zone boundary.

OUTFALL EVALUATION

Proposed permit condition S.13 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall.

WATER RECLAMATION AND REUSE

Section S14 of the permit contains conditions by which King County shall comply to be able to distribute reclaimed wastewater. The conditions were developed in coordination with the State Department of Health to satisfy reclaimed water use and other related regulations of Chapters 90.46 RCW, 90.03 RCW, 90.44 RCW, and 90.48.

This section contains special water reclamation effluent limitations and monitoring schedules. The effluent limitations and monitoring schedule have considered the monitoring schedule and limits specified in the latest edition of Water Reclamation and Reuse Interim or Final Standards (when available) and other applicable conditions. The service area shall be within King County and the service areas of any component agencies outside of King County as identified within applicable wastewater planning documents approved by state and local agencies.

To gain authorization for class A Reclaimed Water use and for the reclaimed water uses not delineated within the Reclamation Criteria a checklist shall be completed. The checklist and its component shall be developed by the Permittee and approved by the Department of Ecology and Health. The project components specified on the water reclamation and reuse and approved checklist and any other approvals will become enforceable under provisions of this NPDES permit.

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GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this permit be issued for 5 years.

REVIEW BY THE PERMITTEE

A proposed permit was reviewed by the Permittee for verification of facts. Only factual items were corrected in the draft permit and fact sheet.

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REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.
1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.
1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.
1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.
1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Metcalf and Eddy.

1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Water Pollution Control Federation.

1976. Chlorination of Wastewater.

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

APPENDICES

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on December, 4, 1996 and December, 11, 1996 in the Seattle Times to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on May, 23, 1997, in the Seattle Times to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Northwest Regional Office
3190 - 160th Avenue SE
Bellevue, WA 98008-5452

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (425) 649-7000, or by writing to the address listed above.

APPENDIX B--GLOSSARY

Acute Toxicity--The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Class 1 Inspection--A walk-through inspection of a facility that includes a visual inspection and some examination of facility records. It may also include a review of the facility's record of environmental compliance.

Class 2 Inspection--A walk-through inspection of a facility that includes the elements of a Class 1 Inspection plus sampling and testing of wastewaters. It may also include a review of the facility's record of environmental compliance.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

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Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Daily Maximum Discharge Limitation--The greatest allowable value for any calendar day.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of rainfall-caused surface water drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Mixing Zone--An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (chapter 173-201A WAC).

Monthly Average --The average of the measured values obtained over a calendar month's time.

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National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

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DETERMINATION OF REASONABLE POTENTIAL

STEPS TO MAKING REASONABLE POTENTIAL DETERMINATION:

1. CALCULATE BACKGROUND WATER QUALITY

RECEIVING WATER SAMPLE RESULTS DURING CRITICAL CONDITIONS:

Sample Results for:	Copper as dissolved (TR)	Lead as dissolved (TR)	Hardness
	2.21	.035	117
	2.02	.053	123
	1.01	.104	109
	2.19	.09	119
	2.92	.05	75.3
	2.04	--	76
*Background Value (MECB) =	3.94 (4.11)	0.123 (0.148)	75.3
<p>* Based on 2 times the geometric mean for metals. The geometric mean is calculated by taking the logarithm of each value, summing the logarithms, dividing the sum by the number of measurements and then taking the antilog of the result. Convert to total recoverable by dividing by 0.96 for copper and 1.46203 - (ln hardness)(0.145712) for lead.</p> <p style="text-align: center;"><u>General Background Rule for Metals:</u> (Assumes CV of 1) If 1-20 data points - multiply the geometric mean by two to estimate the 90th percentile; If >20 data points - calculate 90th percentile</p>			

2. CALCULATE AMBIENT WATER QUALITY CRITERIA (WQC) FOR METALS AS TOTAL RECOVERABLE

For this river the total recoverable-based receiving water criteria (µg/l) are calculated as:

	Copper (Total Recoverable)	Lead (Total Recoverable)
*Acute Criteria Values	13.6	56.9
* Water quality criteria as total recoverable metal (µg/l) at a hardness of		

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75.3 mg/l.

The acute freshwater criteria for copper (dissolved) is given in FR Vol. 60, No. 86 as $(0.960)(e^{(0.9422(\ln(\text{hardness})) - 1.464)})$. At a hardness of 75.3 mg/l, the copper (dissolved) criteria is 13.6 µg/l as shown in the table above.

3. CALCULATE MAXIMUM EXPECTED CONCENTRATION (MEC):

EFFLUENT SAMPLE RESULTS AS TOTAL RECOVERABLE METAL:

Copper (Total Recoverable)	Lead (Total Recoverable)
1317	187
1092	230
1073	258
2664	---
GM = 1424	GM = 223

Effluent samples are used to estimate the **Maximum Expected Concentration (MEC)** as follows:

- (1) The **coefficient of variation (CV)** and the **number of data points (ND)** are used to determine a multiplier from Table 3-2 of EPA's TSD.
- (2) The **highest value (HV)** in the data set is multiplied with the identified multiplier value (i.e., TSD multiplier).
- (3) The resulting product estimates the **maximum expected concentration (MEC)** of the toxic pollutant in the effluent (95th percentile, 95 percent confidence level). See the following:

USE OF MULTIPLIER VALUES AND HIGHEST EFFLUENT CONCENTRATION VALUES TO DERIVE MAXIMUM EXPECTED CONCENTRATION:

POLLUTANT	CV	ND	MULTIPLIER	HV	<u>MEC</u>
Copper	0.6	4	2.6	2664	6926
Lead	0.6	3	3.0	258	774

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The following equation is used to predict the concentration at the edge of a mixing zone:

$$(MEC + (MECB \times (DF - 1))) \div DF = CP$$

where:

CP = CONCENTRATION OF THE POLLUTANT (CP) AT THE EDGE OF THE MIXING ZONE.

MEC = MAXIMUM EXPECTED CONCENTRATION (MEC) OF THE POLLUTANT IN THE EFFLUENT.

MECB = MAXIMUM EXPECTED BACKGROUND CONCENTRATION (MECB) AT TIME OF CRITICAL CONDITION.

DF = MIXING ZONE DILUTION FACTOR (DF) (for either the chronic or acute zone, depending on the calculation).

If the resultant concentration at the edge of the mixing zone (CP) exceeds the water quality criterion (WQC), there is a reasonable potential (RP) and an effluent limit is imposed:

POLLUTANT	MEC	MECB	DF	CP	WQC	<u>RP?</u>
Chlorine	500	0	9.6	52.08	19	YES
Chlorine	500	0	96	5.21	11	NO
Ammonia	10	2	9.6	2.83	6.6	NO
Ammonia	10	2	96	2.08	5.9	NO
Copper	6926	5.84	9.6	726.69	13.6	YES
Copper	6926	5.84	96	77.93		

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CALCULATION OF WATER QUALITY-BASED EFFLUENT LIMITS

Water quality-based effluent limits are calculated by the two-value wasteload allocation process as described on page 100 of the TSD (EPA, 1991) and shown below.

1. Calculate the acute wasteload allocation WLA_a by multiplying the acute criteria by the acute dilution factor and subtracting the background factor. Calculate the chronic wasteload allocation (WLA_c) by multiplying the chronic criteria by the chronic dilution factor and subtracting the background factor.

$$WLA_a = (\text{acute criteria} \times \text{acute zone dilution factor}) - (\text{background concentration} \times (\text{acute zone dilution factor} - 1))$$

$$WLA_c = (\text{chronic criteria} \times \text{chronic zone dilution factor}) - (\text{background concentration} \times (\text{chronic zone dilution factor} - 1))$$

2. Calculate the long term averages (LTA_a and LTA_c) which will comply with the wasteload allocations WLA_a and WLA_c .

$$LTA_a = WLA_a \times e^{[0.5\sigma^2 - z\sigma]}$$

where:

$$\sigma^2 = \ln[CV^2 + 1]$$

$$z = 2.326$$

CV = coefficient of variation = std. dev./mean

$$LTA_c = WLA_c \times e^{[0.5\sigma^2 - z\sigma]}$$

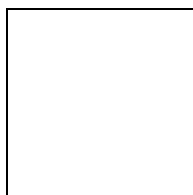
where:

$$\sigma^2 = \ln[(CV^2 \div 4) + 1]$$

$$z = 2.326$$

3. Use the smallest LTA of the LTA_a or LTA_c to calculate the maximum daily effluent limit and the monthly average effluent limit.

Maximum Daily Limit = MDL



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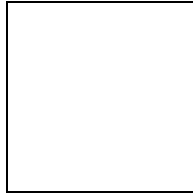
where:

$$\sigma^2 = \ln[CV^2 + 1]$$

$$z = 2.326 \text{ (99th percentile occurrence)}$$

LTA = Limiting long term average

Average Monthly Limit = AML



where:

$$\sigma^2 = \ln[(CV^2 \div n) + 1]$$

n = number of samples/month

z = 1.645 (95th percentile occurrence probability)

LTA = Limiting long term average

APPENDIX D--RESPONSE TO COMMENTS

Following is our response to the comments we received during public notice period.

Response to Ms. Karen Huber, King County NPDES Administer

Comments # 1 - 3

In developing the reasonable potential calculations, we used the maximum concentration figures as presented to us in your permit application for those parameters that were reported. For those that were not reported, or reported as non-detect (ND), we assumed maximum concentration to be the King County MDL since the method detection limits (MDL) used were higher than our recommended MDL. Considering that assumption, we carried out the reasonable potential calculations and developed the limits. In doing so, since the applicant had failed to provide us with their sampling frequency, we used 30 for the number of samples although we agree with you that we should have used the actual number of the samples. Your permit application had not clearly indicated this number. In any case; had we used 70 instead of 30, the result of the reasonable potential study would have been unchanged.

Although presence of these chemicals in your collection system is unlikely -- as you stated, you did not confirm their absence at the same time. However, we agree with you and believe there should be complete effluent characterization for these parameters before we can set any limits for them. In addition, we believe, in such a huge collection system such as King County's with such diverse and numerous industrial users, it is unlikely that parameters listed under WAC 173-201A be absent. And if they are present, they must be controlled and limited to prevent violation of water quality standards.

If you are unable to attain the MDL and quantification limits (QL) in your plant effluent due to matrix effects, you must submit a matrix specific MDL and QL to the Department before characterization. The effluent characterization shall be performed during dry and wet seasons. We recommend you conduct this characterization study for any other parameters that, due to matrix effects, you cannot meet MDL and QL.

We will change the permit requirements and remove the limits for the three organic compounds to reflect these changes. We will conduct reasonable potential calculations after effluent characterization and if appropriate, set limits for these parameters based on the new information. The modified permit will require the King County to, within 12 months from the date of issuance of this permit, develop matrix effect MDL and QL and start characterization immediately. The result of characterization shall be submitted to the Department no later than 36 months from the issuance date of this permit.

Comment #4

We agree with you. Comment was incorporated.

Comment #5

FACT SHEET FOR NPDES PERMIT WA-002958-1
METRO KING COUNTY EAST SECTION RECLAMATION PLANT AT RENTON

Comment was incorporated.

Comment #6

We recommend you follow the method and recommendations provided to you earlier for West Point Plant.

Comment #7

Your permit requires you to conduct monthly grab sampling for pathogen reduction. However, if you believe the use of Class B Alternative 2 a non-sampling/analysis method is identical under 503 you may provide supporting documents and discuss that in your report.

Comment #8

We agree with you.

Comment #9

According to our NPDES permit writer guidelines, PCB testing, as indicated in your permit, is included in minimum testing requirements based on method of sludge use or disposal.

Comment #10

The sampling method is grab composite that is collection of minimum four grab samples- within 24 hours -- in place of each 24 hour composite sample except for oil and grease. Each samples for oil and grease shall be collected and analyzed separately.

Comment #11

We believe the draft NPDES permit contains adequate measures to be protective during emergency situations.

Comment #12

We changed the reporting requirements to once per permit cycles. However, the EPA document, as referred in your draft permit, despite its age, is the only guideline available for us to use. We recommend you use the same document for your reporting. Also, section S4E, Assessment of flow and wasteload, was put back on the permit. This important section mistakenly was removed from the body of the permit. However, it was shown as required submittal under "Summary of Scheduled Permit Report Submittals."

Comment #13

The language is adequate. Please follow the guidelines in your West Point permit. If the Department's Sediment Management Unit approves your SAP monitoring and MDL plan, that will automatically become part of this permit by default. There is no need to assume and mention about a plan or procedure that has not been yet approved in this permit.

Comment #14

FACT SHEET FOR NPDES PERMIT WA-002958-1
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The permit to dispose of the reclaim water is for the class A reuse water. Your permit application requested permit for disposal of class A reuse water. We agree with you about checklist that must be developed. Concerning West Point reuse program, we have not received any information on reclamation program at West Point other than verbal conversation. If you would like to apply for waste water reuse at West Point, you may apply separately. However, we agree with you. Similar conditions can be included in the West Point Permit. The fact sheet will be adjusted to include water reclamation/reuse requirements.

Comment #15

The sampling location for BOD and TSS, the effluent reuse and reclamation, shall be after filtration.

Response to Mr. Peter S. Machno, King County Biosolid Program Manager

Regulation is clear. State of Washington has not adopted any criteria for the beneficial use of sludge yet. Once the criteria for the beneficial use of the sewage sludge are adopted by the State, references in our permit and factsheets will be made to “Biosolid” instead of sludge.